

BOOK CHAPTERS

- A. Howard, E. Tunstel, "Using Geospatial Information for Autonomous Systems Control," Frontiers of Geographic Information Processing, Springer Science, 2004.
- A. Howard, Adventures in Science: On the Job with an Engineer, Compass Books, September 2003.
- E. Tunstel, A. Howard, T. Huntsberger, A. Trebi-Ollenu, J. Dolan, "Applied Soft Computing Strategies for Autonomous Field Robotics," Fusion of Soft Computing and Hard Computing for Autonomous Robotic Systems, Physica-Verlag, 2002.
- E. Tunstel, H. Seraji, A. Howard, Chapter 11: "Soft Computing Approach to Safe Navigation of Autonomous Planetary Rovers", Intelligent Control Systems Using Soft Computing Methodologies, CRC Press, 2001.

JOURNAL PUBLICATIONS

- A. Howard, C. Padgett, "An Adaptive Learning Methodology for Intelligent Object Detection in Novel Imagery Data," to appear NeuroComputing, 2003.
- E. Tunstel, A. Howard, "Approximate Reasoning for Safety and Survivability of Planetary Rovers," Fuzzy Sets and Systems, Feb. 2003.
- E. Tunstel, A. Howard, H. Seraji, "Rule-based reasoning and neural network perception for safe off-road robot mobility", Expert Systems, 19(4), pgs. 191-200, Sept. 2002.
- H. Seraji and A. Howard, "Behavior-Based Navigation on Challenging Terrain: A Fuzzy Logic Approach," IEEE Transactions on Robotics and Automation, 18(3), pgs. 308-321, June 2002.
- A. Howard, H. Seraji, "An Intelligent Terrain-Based Navigation System for Planetary Rovers," IEEE Robotics and Automation Magazine, December 2001.
- A. Howard, H. Seraji, "Vision-Based Terrain Characterization and Traversability Assessment," Journal of Robotic Systems, 18(10), pgs. 577-587, 2001.
- A. Howard, G. Bekey, "Robotics Become Capable of Handling a Rubber Ball," Advanced Manufacturing Technology, John Wiley & Sons, Nov. 2000
- A. Howard, G. Bekey, "Intelligent Learning for Deformable Object Manipulation," Autonomous Robots, 9 (1): 5-6, August 2000.
- A. Howard, C. Padgett, "A generalized approach to real-time pattern recognition in sensed data," Pattern Recognition, vol. 32:12, Dec. 1999.

CONFERENCE PUBLICATIONS

- A. Howard, G. Rodriguez, "Validating Mission Relevance of Autonomy Technologies through Increased Science Return," Workshop on Machine Learning in Space Systems, 20th International Conference on Machine Learning, Washington, D.C., August 2003.
- S.Mobasser, C.C.Liebe, A.Howard, "Fuzzy Image Processing in Sun Sensor," International Fuzzy Systems Association World Congress , Istanbul, Turkey, June 2003.
- A. Howard, B. Werger, H. Seraji, "Integrating Terrain Maps into a Reactive Navigation Strategy" to appear IEEE Int. Conf. On Robotics and Automation, Taiwan, September 2003.

- A. Howard, H. Seraji, B. Werger, "A Global Path Planner using the Terrain Traversability Index," to appear Seventh International Conference on Automation Technology, Taiwan, September 2003.
- A. Howard, H. Seraji, "A Rule-Based Fuzzy Safety Index for Landing Site Risk Assessment," 9th International Symposium on Robotics and Applications, Orlando, FL., June 2002.
- E. Tunstel, A. Howard, "Sensing and Perception Challenges in Planetary Surface Robotics," IEEE Sensors, Orlando, FL., June 2002.
- A. Howard, "A Novel Information Fusion Methodology for Intelligent Terrain Analysis," IEEE International Conference on Fuzzy Systems (FUZZ-IEEE), Honolulu, HI, May 2002.
- A. Howard, H. Seraji, B. Werger, "Fuzzy Terrain-Based Path Planning for Planetary Rovers," World Congress on Computational Intelligence, Honolulu, HI, May 2002.
- C.C.Liebe, S.Mobasser, C.J.Wrigley, Y.Bae, A.Howard, J.Schroeder, "Micro Sun Sensor," IEEE Aerospace conference, Big Sky, Montana, March 2002.
- S.Mobasser, C.C.Liebe, A.Howard, "Fuzzy Image Processing in Sun Sensor," 10th IEEE International Conference on Fuzzy Systems, Melbourne, Australia, Dec. 2001.
- S. Mobasser, C.C. Liebe, A. Howard, "Application of Fuzzy Logic in Sunsensor Data Interpretation," 2nd International Conference on Intelligent Technologies (InTech'2001), Bangkok, Thailand, Nov. 2001.
- A. Howard, E. Tunstel, D. Edwards, A. Carlson, "[Enhancing Fuzzy Robot Navigation Systems by Mimicking Human Visual Perception of Natural Terrain Traversability.](#)" Joint 9th IFSA World Congress and 20th NAFIPS International Conference, Vancouver, Canada, July 2001.
- H. Seraji, A. Howard, E. Tunstel, "Terrain-Based Navigation of Planetary Rovers: A Fuzzy Logic Approach," 6th Int. Symposium on Artificial Intelligence, Robotics and Automation in Space, Montreal, Canada, June 2001.
- A. Howard, H. Seraji, E. Tunstel "[A Rule-Based Fuzzy Traversability Index for Mobile Robot Navigation.](#)" IEEE Int. Conf. On Robotics and Automation, May 2001.
- H. Seraji, A. Howard, E. Tunstel, "Safe Navigation on Hazardous Terrain," IEEE Int. Conf. On Robotics and Automation, May 2001.
- E. Tunstel, A. Howard, H. Seraji, "Fuzzy Rule-Based Reasoning for Rover Safety and Survivability," IEEE Int. Conf. On Robotics and Automation, May 2001.
- C. Padgett, A. Howard, S. Udomkesmalee, "Shape Based Object Recognition Using a Fast Analog Convolution Processor," NASA/DoD Second Biomorphoc Explorers Workshop, Dec. 2000.
- A. Howard, H. Seraji, "Real-Time Assessment of Terrain Traversability for Autonomous Rover Navigation," IEEE/RSJ Intern. Conf. on Intelligent Robots and Systems (IROS 2000), Nov. 2000.
- A. Howard, H. Seraji, "[A Real-Time Autonomous Rover Navigation System.](#)" World Automation Congress, June 2000.
- A. Howard, G. Bekey, "[A Learning Methodology for Robotic Manipulation of Deformable Objects.](#)" World Automation Congress, June 2000.
- A. Howard, C. Padgett, K. Brown, "[Real Time Intelligent Target Detection and Analysis with Machine Vision.](#)" World Automation Congress, June 2000.

- A. Howard, G. Bekey, "Intelligent Learning for Deformable Object Manipulation," IEEE Intern. Symposium on Computational Intelligence in Robotics and Automation, Nov. 1999.
- A. Howard, C. Padgett, K. Brown "Intelligent Target Detection in Hyperspectral Imagery," 13th Applied Geologic Remote Sensing Conference, March 1999.
- A. Howard, C. Padgett, C. Liebe "A Multi-Stage Neural Network for Automatic Target Detection," Int. Joint Conference on Neural Networks (IJCNN), May 1998.
- A.M. Howard, G.A. Bekey, "Recursive Learning for Deformable Object Manipulation," 8th Int. Conf. Advanced Robotics, pp. 939-943, July 1997.
- A.M. Howard, G.A. Bekey, "Prototype system for automated sorting and removal of bags of hazardous waste," Intelligent Robots and Computer Vision XV: Algorithms, Techniques, Active Vision and Materials Handling, Proc. SPIE 2904, pp. 271-277, Nov. 1996.

TECHNICAL REPORTS

- A. Howard, G. Chalfant, E. Rogstad, "Artificial Intelligence Toolkit to Enhance Understanding and Knowledge," New Technology Report No. 40496, June 2003.
- A. Howard, "A Fuzzy Logic Engine for Space Applications," New Technology Report No. 40461, June 2003.
- A. Howard, I. Nesnas, D. Helmick, B. Werger, R. Cipra, R. Murray, R. Christian, "A Novel Reconfigurable Rover for Navigation on Rough Terrain," New Technology Report No. 30890, February 2003.
- A. Howard, H. Seraji, B. Werger, "Integrating Terrain Maps into Reactive Navigation Strategies," New Technology Report No. 30794, August 2002.
- A. Howard, H. Seraji, B. Werger, "Rover Path Planning using Vision-Based Terrain Characteristics," New Technology Report No. 30744, August 2002.
- A. Howard, E. Tunstel, "Development of Cognitive Sensors," NASA Tech Briefs, pp. 38, April 2002.
- A. Howard, "Path-Planning Graphical User Interface," NASA Tech Briefs, July 2002.
- A. Howard, "A Software Tool for Real-Time Terrain Classification," New Technology Report No. 21234, Feb. 2001.
- H. Seraji, A. Howard, B. Bon, "Fuzzy Logic Navigation of Mobile Robots," New Technology Report No. 21199, Dec. 2000.
- A. Howard, "Recursive Learning for Deformable Object Manipulation," IRIS technical report IRIS-99-369, University of Southern California, pp. 1-169, 1999.
- C. Padgett, A. Howard, et al. "Real Time Sub-Pixel Object Detection in Hyperspectral Images," JPL Doc. D-16150, Sept. 1998.
- A. MacCalla, "Real Time Data Analysis of Intelligent Neural Systems for Launch Vehicle Health Monitoring," JPL Doc. 10296, Dec. 1992.

INVITED SPEAKER

- Lecture: “Robots in Space,” Astronomy Guest Lecture Series, Santa Monica College, CA, May 2003.
- Speaker: “The Souls of Black Folk (100th Anniversary)”, Tinker AFB Black History Month Banquet, Oklahoma, March 2003.
- Panel: “Women Working on Mars,” National Engineers Week WebCast, Pasadena, CA, Jan 2003.
- Seminar: “Neural Networks, Robotics, Fuzzy Logic, Machine Vision, What’s It All About?” 2nd Annual Careers in Math, Science, and Technology Conference, CA, Jan 2003.
- Lecture: “Robotic Exploration of Mars,” Chabot Space and Science Center, Space Day 2002, May 2002.
- Panel: “Women in Science,” Techbridge: Encouraging Girls in Technology WebCast, January 2002.
- Panel: “Careers at JPL/NASA,” Young African American Women’s Conference, Pasadena City College, October 2001.
- Seminar: “Robotics Research at JPL,” North Carolina A&T Computer Science Colloquium, Sept. 2001.
- Seminar: “Robotics and Artificial Intelligence”, Santa Monica City College, March/Sept. 2000.
- Workshop: "Hybrid Systems: Effective ways to combine genetic algorithms, neural networks, and fuzzy systems for real-world applications," World Automation Congress, Maui, HI, June 2000.
- Tutorial: “Robotics in the 21st Century,” Society of Women Engineers Regional Conference, Santa Monica, Ca, February 2000.

FEATURED ARTICLES

- Science@NASA, "[Brainy 'Bots](#)," May 2001.
- NASA Tech Briefs, "[Who’s Who at NASA](#)", August 2001.
- Mars Exploration Program, "[JPL's Bionic Woman, Dr. Ayanna Howard](#)", August 2002.